

ICESat-2 simulated data from airborne altimetry

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Ice, Cloud, and land Elevation Satellite-2 (ICESat-2) is scheduled to launch in 2015 and will carry onboard the Advanced Topographic Laser Altimeter System (ATLAS), which represents a new approach to spaceborne determination of surface elevations. Specifically, the current ATLAS design is for a micropulse, multibeam, photon-counting laser altimeter with lower energy, a shorter pulse width, and a higher repetition rate relative to the Geoscience Laser Altimeter (GLAS), the instrument that was onboard ICESat. Given the new and untested technology associated with ATLAS, airborne altimetry data is necessary (1) to test the proposed ATLAS instrument geometry, (2) to validate instrument models, and (3) to assess the atmospheric effects on multibeam altimeters. We present an overview of the airborne instruments and datasets intended to address the ATLAS instrument concept, including data collected over Greenland (July 2009) using an airborne SBIR prototype 100 channel, photon-counting, terrain mapping altimeter, which addresses the first of these 3 scientific concerns. Additionally, we present the plan for further simulator data collection over vegetated and ice covered regions using Multiple Altimeter Beam Experimental Lidar (MABEL), intended to address the latter two scientific concerns. As the ICESAT-2 project is in the design phase, the particular configuration of the ATLAS instrument may change. However, we expect this work to be relevant as long as ATLAS pursues a photon-counting approach.